

PATENT COOPERATION TREATY

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INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY
(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference PB/POE51120	FOR FURTHER ACTION See Form PCT/IPEA/416	
International application No. PCT/SE 2003/001366	International filing date (day/month/year) 08.09.2003	Priority date (day/month/year) 09.09.2002
International Patent Classification (IPC) or national classification and IPC C10M 125/26		
Applicant Eagle Water Ltd. et al		

1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of 4 sheets, including this cover sheet.
3. This report is also accompanied by ANNEXES, comprising:
 - a. ☒ (sent to the applicant and to the International Bureau) a total of 2 sheets, as follows:
 - ☒ sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).
 - ☐ sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.
 - b. ☐ (sent to the International Bureau only) a total of (indicate type and number of electronic carrier(s)) _____, containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).

4. This report contains indications relating to the following items:

<input checked="" type="checkbox"/>	Box No. I	Basis of the report
<input type="checkbox"/>	Box No. II	Priority
<input type="checkbox"/>	Box No. III	Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
<input type="checkbox"/>	Box No. IV	Lack of unity of invention
<input checked="" type="checkbox"/>	Box No. V	Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability, citations and explanations supporting such statement
<input type="checkbox"/>	Box No. VI	Certain documents cited
<input type="checkbox"/>	Box No. VII	Certain defects in the international application
<input type="checkbox"/>	Box No. VIII	Certain observations on the international application

Date of submission of the demand 13.04.2004	Date of completion of this report 08.06.2004
Name and mailing address of the IPEA/SE Patent- och registreringsverket Box 5055 S-102 42 STOCKHOLM Facsimile No. +46 8 667 72 88	Authorized officer Bengt Christensson/ELY Telephone No. +46 8 782 25 00

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

PCT/SE 2003/001366

Box No. I Basis of the report

1. With regard to the language, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.

- ☒ This report is based on a translation from the original language into the following language English, which is the language of a translation furnished for the purposes of:
- ☐ international search (under Rules 12.3 and 23.1(b))
- ☒ publication of the international application (under Rule 12.4)
- ☐ international preliminary examination (under Rules 55.2 and/or 55.3)

2. With regard to the elements of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report)*:

- ☐ the international application as originally filed/furnished
- ☒ the description:
- pages 1-4 as originally filed/furnished
- pages* _____ received by this Authority on _____
- pages* _____ received by this Authority on _____
- ☒ the claims:
- pages _____ as originally filed/furnished
- pages* _____ as amended (together with any statement) under Article 19
- pages* 1-2 received by this Authority on 13.04.2004
- pages* _____ received by this Authority on _____
- ☐ the drawings:
- pages _____ as originally filed/furnished
- pages* _____ received by this Authority on _____
- pages* _____ received by this Authority on _____
- ☐ a sequence listing and/or any related table(s) – see Supplemental Box Relating to Sequence Listing.

3. ☐ The amendments have resulted in the cancellation of:

- ☐ the description, pages _____
- ☐ the claims, Nos. _____
- ☐ the drawings, sheets/figs _____
- ☐ the sequence listing (*specify*): _____
- ☐ any table(s) related to the sequence listing (*specify*): _____

4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).

- ☐ the description, pages _____
- ☐ the claims, Nos. _____
- ☐ the drawings, sheets/figs _____
- ☐ the sequence listing (*specify*): _____
- ☐ any table(s) related to the sequence listing (*specify*): _____

* If item 4 applies, some or all of those sheets may be marked "superseded."

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International Application No.

PCT/SE 2003/001366

Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims	<u>1-5</u>	YES
	Claims		NO
Inventive step (IS)	Claims	<u>1-5</u>	YES
	Claims		NO
Industrial applicability (IA)	Claims	<u>1-5</u>	YES
	Claims		NO

2. Citations and explanations (Rule 70.7)

The invention

The claimed invention concerns a method for producing a solution having lubrication properties. The solution is intended to be used as an additive preferably to a liquid fuel. The invention also refers to a solution and the use thereof.

It is previously known that boron acid can be used as an additive to fuels to accomplish a friction reducing effect. The additive made by this method over time has a limited stability.

The problem is solved in that a boric compound such as boric acid and/or boric oxide is dissolved in a solvent. The solvent has hydrogen bonds that counteract the electro negativity of the boric compound. The solution has a high concentration of borate thanks to the hydrogen bonds.

Cited documents

These documents are cited in the International Search Report. The citations are considered to describe the most relevant prior art:

D1) US-A1-4 557 844

D2) US-A1-4 524 004

Friction reducing additives for liquid fuels are previously known from D1 (column 1, lines 9-14). One problem to be solved

.../...

Supplemental Box

In case the space in any of the preceding boxes is not sufficient.

Continuation of: Box V

according to D1 is to provide stabilising properties (column 2, lines 11-16). Furthermore, the document teaches that reaction occurs when diols and boron compounds are interacted (column 2, line 34-column 3, line 20).

The publication also reveals that anti-oxidants may be present in the composition (column 4, lines 13-17).

Reference is also made to D2, which discloses the same technology as that of D1.

Analysis

D1 and D2 are cited in the International Search Report as documents of particular relevance and are now considered to show the closest background art. The reason for this review is that amended claim 1 of April 13, 2004, now specifies that the mixture is stirred and/or shaken.

These features are not revealed in D1 or D2. Consequently, neither D1 nor D2 anticipates the technique of claim 1.

The method for producing a solution according to amended claim 1 is considered to give rise to an unexpected technical effect, i.e. the concentrate of borate is increased in relation to earlier technique. Thus, this claim is not considered to describe a technique that is obvious to a person skilled in the art.

Since independent claims 4, 5 refer to amended claim 1, the content of these claims 4, 5 also involves an inventive step.

Conclusion

In accordance with the arguments stated above, the invention in claims 1-5 is novel, considered to involve an inventive step and has industrial applicability.

REPLACED BY
ART 34 AMDT**Claims**

1. A method for producing a solution having lubrication properties intended to be used preferably as an additive as a concentrate blended to a liquid, such as a liquid fuel, **characterized in** that a boric compound such as boric acid and/or bortrioxide is dissolved in a solvent and the borate ions are in a homogene phase together with the solvent, which as a solution in stable conditions is made to have a high concentration of borate thanks to the hydrogen bonds counter action to the electro negativity of the boric compound and its tendency to covalent bonding, the solution being used as and additive to the actual liquid, which in this way receive friction reducing, lubricating and corrosion inhibiting characteristics.

2. A method according to claim 1, **characterized in** that the solvent is an alcohol and/or water or liquid hydrogen and the mixture is shaken to dissolve the boric compounds at the same time as the dissolving time is accelerated by using heat.

3. A method according to claim 1, **characterized in** that the mixture is shaken, with or without mechanical elements added to further accelerate the dissolving of the boric compound in the solution by warming up or with aid of a combination thereof.

4. A method according to claim 1, **characterized in** that the addition of the boric compound in the solution makes a solution with a borate concentration exceeding 250,000 ppm or more.

5. The use of a solution made according to claim 1 as an additive to a fuel in a blending, depending to the type of fuel, gives a concentration of boric compound in the range of 10 to 1,000 ppm.

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6. A solution made as an additive according to any of the preceding claims by dissolving a boric compound, boric acid and/or bortrioxide.

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